

Amendment

U.S. Patent Application No. 10/678,636

REMARKS

Claims 1-78 and 80-106 are pending in the subject application. Claims 1-97 have been examined and stand rejected, and claims 22, 43, 68 and 79 have further been objected to. By way of the above amendments, claims 3-5, 7-11, 14-16, 18-22, 29, 31-33, 35-39, 43, 46, 53-61, 70-79, 83, 85-87, and 89-91 have been amended, claim 79 has been canceled, and new claims 98-106 have been added. Support for the amended and new claims can be found throughout the specification. Favorable reconsideration of the application and allowance of all of the pending claims are respectfully requested in view of the above amendments and the following remarks.

In the present Office Action, the Examiner suggests a new title be provided. As indicated by the above amendments, the title has been amended in accordance with the Examiner's suggestion.

A number of claims have been rejected under 35 U.S.C. §112, 2nd paragraph, due to the language "and/or," "is/are" and "on or above" in the claim language. In particular, the Examiner asserts that these terms result in confusion, since they fail to show what is and what is not included in the claimed subject matter. Applicants respectfully disagree, since the use of such terms is acceptable and appropriate for use in claim language, and these terms present no confusion or uncertainty as to what is being claimed. However, in an effort to overcome this rejection, the claims that include the limitations "and/or" and "is/are" have been amended to remove all instances of the use of the terms objected to by the Examiner, while maintaining the alternative options in these claims.

Regarding the language "a production flow control device on or above the well-head" as recited in claim 62, this language has not been amended since it is clear on its face and presents no issues under 35 U.S.C. §112, 2nd paragraph. It is permissible to provide claim limitations in the alternative (see, e.g., MPEP §2173.05(h)II), and this particular limitation clearly sets forth that the production flow control device is either on the well-head or above the well-head. The Examiner is therefore requested to withdraw the rejection to claim 62 and also to the other claims based upon 35 U.S.C. §112, 2nd paragraph.

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Claims 22, 43, 68 and 79 are objected to due to incorrect claim dependencies or being duplicative. By way of the above amendments, claim 79 has been canceled and the claim dependencies of claims 22 and 43 have been changed per the Examiner's suggestion. The Examiner is now requested to withdraw the objections to these claims.

Claims 1-24, 29-41, 46-66, 68-80 and 83-91 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0196820 to Patel, while claims 92-97 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,810,954 to Garrett et al. ("Garrett"). In addition, claims 25-27, 42-44, 67 and 81 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Patel in view of Garrett, while claims 28, 45 and 82 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Patel in view of U.S. Patent Application Publication No. 2004/0079529 to Bartlett. Applicant respectfully traverses and requests the Examiner to reconsider these rejections based upon the following remarks.

In addition, a Declaration has also been provided by an employee of Woodside Energy Limited (the Assignee of the subject application) who qualifies as one having ordinary skill in the art of completing, suspending and working over deep sea wells. In particular, the Declaration provides a background of the subject matter of the invention that may be useful to the Examiner, and also an opinion by the Declarant as to why the primary references utilized by the Examiner (i.e., Patel and Garrett) are so different from the subject invention that they cannot be considered to anticipate or render obvious the pending claims.

As noted in the Declaration (see paragraphs 1-11 of the Declaration), which supports the background disclosure set forth in the Specification (see pages 1-7 of the Specification), statutory requirements mandate the use of two independently verifiable barriers being in place at all times during deep sea well completions, suspensions and work-over operations to ensure control of the well and stop any flow of hydrocarbons up and through the bore of the well. The conventional and long-standing industry practice when suspending a well has been to position one of the two barriers (referred to as "the deep set plug") below an anticipated depth of the lowermost end of a completion string, while the second barrier is positioned toward an upper end of the well-bore. This ensures that the first and second barriers are far enough apart from each other when secured

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within the well to allow the integrity of each of the barriers to be independently verified. However, in completing the well, the second barrier (referred to as “the shallow plug”) has to be removed to facilitate installation of the tubing or completion string. In order to do this, and to satisfy the statutory requirement of maintaining two barriers at all times during well completions, a blow-out preventer or BOP stack (which includes a series of shut-off valves) must first be installed at the well prior to removing the second barrier and completing the well.

As further noted in the Declaration and the Specification, there are driving factors long held within this industry for maintaining the distance between the deep set plug and the shallow plug. One consideration is that there is a cost reduction in running the wire line that retrieves the shallow plug. In addition, the far spacing between the deep set and shallow plugs renders it easier to independently verify the integrity of each of the two barriers.

In the present invention, both the first and second barriers are placed in closer proximity to each other, which differs from conventional and industry standard practices. In the present invention, each barrier is situated within the well at a sufficient depth that is below a depth lat which a lowermost end of a completion string will be placed within the well when the well is to be completed. By providing the two barriers at these locations within the well, there is no need to provide a BOP stack each time a well is to be completed in order to satisfy the statutory requirements as noted above, which results in a significant savings when completing the well (evidence of such cost savings is provided at paragraphs 8-10 of the enclosed Declaration). In addition, the present invention includes providing a pressure measuring device (e.g., a pressure transducer) between the barriers to facilitate independent verification that the barriers are able to maintain reservoir pressure.

The invention also facilitates the ability to form a completed assembly, which includes a christmass tree, tubing hanger, and completion string, above the water line and the running of this completed assembly to the well during completion of the well. This also differs significantly from conventional industry practice. In particular, the shallow plug used in conventional industry practice provides an obstruction that must first be removed prior to insertion of the completion string in the well. The removal of the shallow plug requires the use of a BOP stack

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(as noted above). In a conventional operation, when completing a well, a christmas tree is first installed on the well-head, followed by re-running and securing the BOP stack to the christmas tree in order to maintain well control during removal of the shallow plug, and then running the completion string through the BOP stack and into the well (this series of operations is described in greater detail and in relation to using a horizontal christmas tree at page 25, line 26, to page 26, line 21, of the Specification). Thus, conventional well completion operations do not run a completed assembly into the well in a single operation.

Referring to the claims, independent claim 1 recites a method of suspending a well, including the steps of providing first and second barriers within the well where the first and second barriers are below a depth of a lowermost end of a completion string when the completion string is installed in the well and remain in position while the well is suspended.

In addition, each of independent claims 12, 29, 47, 62 and 83 recites a feature of positioning of first and second barriers within a well in a similar manner as recited in claim 1, where the first and second barriers are located within the well at a depth below the depth at which the lowermost end of a completion string is located when the completion string is within the well. In particular, claim 12 recites a method of completing a well, including the steps of providing first and second barriers in the well, where the first and second barriers are below a depth of the lowermost end of the completion string when the completion string is installed in the well.

Claim 29 recites a method of working over a completed well, including the steps of providing first and second barriers within the well, where the first and second barriers are below a depth of the lowermost end of the completion string when the completion string is installed in the well.

Claim 47 recites a suspended well including the feature of first and second independently verifiable barriers positioned in a spaced-apart relationship in the well bore defining a space therebetween, where the first and second barriers are below an anticipated depth of a lowermost end of a completion string when the completion string is installed in the well.

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Claim 62 recites a completed well including the feature of first and second independently verifiable barriers positioned in a spaced-apart relationship in the well bore defining a space between the first and second barriers, where the first and second barriers are below the lowermost end of a completion string installed in the well-bore.

Claim 83 was amended to recite a dual barrier system for use in suspending, completing or working over a well, including the feature of providing a first and second body barrier positioned in a spaced-apart relationship in the well and defining a space between the first and second barriers, where the first and second barriers provide a barrier to the flow of hydrocarbons through the bore of the well while the well is suspended, completed or worked over.

Initially, it is noted that Patel fails to teach any barrier as recited in independent claims 1, 12, 29, 47, 62, and 83. While Patel teaches a completion assembly for use in a well, the teachings of Patel address problems in a well that are different from the problem addressed and solved in the present invention. Patel describes the use of inflatable packers that facilitate the isolation of zones in a producing well. These packers are different from the recited barriers of the claims, which are used to maintain well control during suspension, completion and working over a well by preventing the flow of any hydrocarbons from the well while the barriers are secured in place within the well.

The packers described in Patel are external casing packers that are disposed within an annulus defined between the outer diameter of a casing string and the inner diameter of the well bore wall (see, e.g., Figs. 1 and 3 of Patel). The external casing packers of Patel provide zonal isolation within the defined annulus but are not capable of preventing fluid flow through the inner bore of the completion string, since the packers surround and are not disposed within the casing string. The only way Patel could prevent flow of fluids in the same manner as the recited barriers is to provide some form of an internal plug within the inner bore of the casing string. This significant difference between the packers of Patel and the recited barriers of the claims is also discussed in the attached Declaration (see paragraphs 12 and 13). Thus, the packers of Patel cannot reasonably be construed as the recited first and second barriers of the claims.

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Further, even assuming that the packers of Patel could be construed as the recited barriers of the claims, there is no disclosure in Patel of providing the packers in the well at a location that is below the lowermost depth of a completion string as recited in each of claims 1, 12, 29, 47, 62, and 83. In fact, this is acknowledged by the Examiner. The Examiner asserts (page 4 of Office Action) that, although Patel “*does not state the barriers are below the depth of the lowermost end of a completion string, in viewing figures 4 and 6 it is easily discernable that the barriers as disclosed are capable of being positioned in such a manner.*”

Whether or not Patel may be capable of providing the packers at a level within the well that can be construed as a depth that is below the lowermost end of the completion string when the completion string is installed in the well, as suggested by the Examiner, does not mean that Patel in fact teaches this feature. As clearly set forth at MPEP §2131, **a reference must teach every element of the claim to anticipate the claim**. Thus, the Examiner’s rejection of claims 1, 12, 29, 47, 62, and 83 as being anticipated by Patel is improper, since Patel fails to teach every limitation of these claims, with particular regard to the lack of any disclosure in Patel of placing the packers at a depth below the lowermost end of a completion string. The Examiner is therefore requested to withdraw this improper rejection of these claims based upon Patel.

Furthermore, it is submitted that Patel fails to render obvious the combination of features of independent claims 1, 12, 29, 47, 62, and 83. This is because there is no teaching in Patel, or any recognition for that matter, of the circumstances surrounding the requirement of providing two verifiable barriers in the well and the issues surrounding the placement of the barriers within the well (as noted above and in the subject application). There is simply no motivation that would exist for one skilled in the art, absent improper hindsight by relying upon the teachings of the subject application, to reposition two external casing packers in the apparatus of Patel below the lowermost end of a completion string, let alone the additional features of adding an internal plug that prevents the flow of fluid (e.g., hydrocarbons) through the inner bore of each packer and/or the casing string which is surrounded by each packer.

The attached Declaration further provides support for the non-obviousness of the invention in view of Patel, Garrett and/or any other references, with particular regard to the

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commercial success of the invention (e.g., in terms of enormous savings in operating costs). Accordingly, claims 1, 12, 29, 47, 62, and 83 are not anticipated or rendered obvious by Patel, Garrett, or any combination of these two references with each other and/or with any of the other cited references. The Examiner is therefore requested to withdraw the rejection of these claims based upon Patel.

Independent claim 92 recites a method of completing a sub-sea well using a horizontal christmas tree for production flow control, the horizontal christmas tree having a body, and the method comprising the steps of: forming an assembly by installing a completion string terminating at its upper end in and suspended from a tubing hanger in the body of the horizontal christmas tree; and running the assembly to the sub-sea well, the method characterised in that the tubing hanger and the horizontal christmas tree are above the water-line during the step of forming the assembly.

The Examiner asserts that Garrett anticipates claim 92. Applicants respectfully disagree. There is simply no teaching in Garrett that describes forming an assembly as recited in claim 92, where such assembly is formed above the water-line. However, the Examiner asserts (see page 6 of the present Office Action) that Garrett discloses an apparatus “capable” of performing the method steps of claim 92. However, as noted above, it is not sufficient to assert that a reference is “capable” of performing the elements of a claim. Rather, in order to establish a proper anticipation rejection, the Examiner is required to show how Garrett in fact teaches every element of claim 92 (see MPEP §2131). Since the Examiner has failed to do this, and since there is no teaching in Garrett of each and every element of claim 92, the Examiner’s assertion that claim 92 is anticipated by Garrett is improper and should be withdrawn.

In addition, claim 92 is not obvious in view of Garrett. As noted above, and as further set forth in the attached Declaration (see paragraph 14), the invention deviates from conventional deep sea well completion operations in that a completed assembly (including a christmas tree, tubing hanger, and completion string) can be assembled above the water-line and then run to the well in one piece for installation. This is not possible in conventional operations, since a BOP stack must be in place to remove the shallow plug prior to installation of the completion string.

As noted above, there is no express teaching in Garrett of forming a tubing hanger with a

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christmas tree above the water-line and in the manner recited in claim 92. However, there is an express teaching in Garrett (see, e.g., Col. 4, line 23 to Col. 6, line 26 and also claim 22 of Garrett) of installing a side valve tree on the wellhead first, followed by landing a tubing hanger in the side valve tree when the valve tree is already installed (i.e., below the water line). As set forth in the Declaration (see paragraph 15), the apparatus of Garrett would require a BOP stack to be run on top of the side tree valve to supplement well control and allow removal of the shallow plug or barrier. The tubing hanger would then be run into the well through the BOP stack in a separate operation.

Thus, claim 92 is not anticipated or rendered obvious by Garrett, when considered alone or in combination with Patel or any of the other cited references. The Examiner is therefore requested to withdraw the rejection of this claim based upon Garrett.

Claims 2-11, 13-28, 30-46, 63-78, 80-82, 84-91 and 93-97 depend from one of claims 1, 12, 29, 47, 62, 83, and 92 and thus include all of the limitations of their parent claims. Accordingly, these claims should also be allowed over Patel, Garrett and/or any other combination of the cited references, and the Examiner is requested to withdraw the rejections of these claims.

Further, it is respectfully submitted that there is no combination of Patel with Garrett that would render obvious claims 25-27, 42-44, 67 and 81. In rejecting these claims, the Examiner acknowledges that Patel fails to disclose a horizontal christmas tree connected to a wellhead. However, the Examiner asserts that providing a horizontal christmas tree to the apparatus of Patel would have been obvious. Applicants respectfully disagree.

As noted above, there is no teaching in Patel of providing first and second barriers within the well at a location that is below the depth of the lowermost end of the completion string. There is further no teaching in Garrett to make up for the deficiencies of Patel. As set forth in MPEP §2143, in order to establish a *prima facie* case of obviousness, the references must teach or suggest all of the claim limitations. Since neither Patel nor Garrett teaches the placing of first and second barrier as required for claims 25-27, 42-44, 67 and 81, the Examiner has not met the *prima facie* burden of obviousness. Therefore, the rejection of claims 25-27, 42-44, 67 and 81 as being obvious over Patel in view of Garrett should be withdrawn.

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Similarly, the rejection of claims 28, 45 and 82 as being obvious over Patel in view of Bartlett should also be withdrawn since the Examiner has not met the *prima facie* burden for establishing obviousness. This is because Bartlett also does not teach the feature of providing first and second barriers within the well at a location that is below the depth of the lowermost end of the completion string as required for claims 28, 45 and 82. Furthermore, the teachings of Bartlett teach away from providing a second barrier within the well in the manner set forth for these claims, since Bartlett expressly teaches a second well control barrier that is placed within the tubing hanger (see paragraph [0030] of Bartlett).

The Examiner has further provided no motivation as to why one would modify Patel and/or Bartlett to obtain the feature of two barriers disposed within the well below a depth of the lowermost end of a completion string when the completion string is installed in the well. There is no combination of Patel with Bartlett, absent improper reliance on the subject application, that would render obvious this claimed feature. Since no combination of Patel and Bartlett renders obvious claims 28, 45 and 82, the Examiner is requested to withdraw the rejection of these claims based upon these references.

New claim 98 recites a method comprising coupling a tubing string with a Christmas tree above water, and landing the Christmas tree on a subsea wellhead. New claim 103 recites a method comprising coupling a tubing string with a tubing hanger above water, landing the tubing hanger on a subsea wellhead, and landing a Christmas tree on the subsea wellhead. None of the cited references discloses or renders obvious this combination of features, and thus claims 98 and 103 should be allowed over the cited references. Since new claims 99-102 and 104-106 depend from one of claims 98 and 103, these claims should also be allowed over the cited references.

In view of the foregoing, the Examiner is respectfully requested to find the application to be in condition for allowance with claims 1-78 and 80-106. However, if for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to call the undersigned attorney to discuss any unresolved issues and to expedite the disposition of the application.

A petition for a three month extension of time and petition fee are being submitted along

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with this Amendment. Applicant hereby petitions for any additional extension of time that may be required to maintain the pendency of this case.

Respectfully submitted,



Andrew J. Aldag
Registration No. 40,483

EDELL, SHAPIRO & FINNAN, LLC
1901 Research Boulevard, Suite 400
Rockville, Maryland 20850-3164
(301) 424-3640

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